Appendix #14b

Utah Foundation, "Creating An Oasis Part 2: Water Consumption Pricing and Conservation in Utah," April 2002

Utah FOUNDATION Research Report

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Highlights

- Utah is entering its fourth year of below average snow pack. Snow pack levels range from 31% to 87% of average levels.
- Utah has a per capita consumption rate of 255 gallons a day. Eighty-five percent of Utah's water is used for agriculture purposes. This is consistent with western states consumption patterns.
- While eastern states have smaller per capita consumption, they also have one predominate water user, thermo-electric generation, which can account for up to 83% of water usage.
- Sixty three percent of water used in Utah homes is used for outdoor purposes, including watering the lawn.
- Utah has some of the lowest prices for water in the western United States, at $1.15 per 1,000 gallons.
- In Salt Lake County, on average, only 49.5% of the cost of water is paid through retail billing.
- Nineteen percent of water costs within Salt Lake County are paid through property taxes.

Utah Foundation is a nonprofit, non-advocacy research organization. Our mission is to encourage informed public policy making and to serve as Utah's trusted source for independent, objective research on crucial public policy issues.

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Creating an Oasis, Part Two: Water Consumption, Pricing and Conservation in Utah

Since Utah Foundation released the first part of this report in February, the outlook on water availability for the summer months has continued to look grim. Snow pack levels within the state continue to be below historical averages; ranging from 31 percent for the feeders of the Virgin River to 87 percent for those feeding into the Weber and Ogden Rivers as well as those feeding into the Provo and Jordan Rivers and Utah Lake.[1] Figure One highlights snow water equivalent levels for basins around the state.

Unless the state receives significant precipitation over the next month, Utah will be in its fourth year of drought. Sandy City has already enacted ordinances requiring 'efficient irrigation systems' and permanently prohibiting outdoor watering between the hours of 10 am and 6pm.[2] Other cities are working on similar ordinances in an attempt to curb wasteful water practices. While such ordinances are not uncommon, the severity of punishment against violators indicates the level of concern city officials have for this issue. Violators in Sandy will be charged with a class C misdemeanor and could receive up to a $750 fine and/or three months in jail.

Figure 1

Utah Snowpack Levels

By Basin, as of 3/25/2002

	Snow Water Equivalent		
	Inches		% of
Basin	Current	Average	Average
Weber Ogden Rivers	20.1	22.5	87%
Provo River, Jordan River, Utah Lake	18.2	20.1	87%
Bear River	18.1	22.5	80%
Tooele Valley-Vernon Creek	14.3	19.0	75%
Green River	7.4	10.4	72%
Duchsne River	9.8	15.0	65%
Price-San Rafael	11.4	16.6	68%
Dirty Devil	7.3	10.8	67%
Sevier River	8.2	14.2	60%
South Eastern Utah	6.1	11.7	52%
Beaver River	7.5	15.5	48%
Escalante River	4.6	10.2	41%
Virgin River	3.7	12.0	31%
Statewide Average	**12.3**	**16.8**	**73%**

Source: USDA-Natural Resource Conservation Service, SLC Data Collection Office. SNOTEL data March 25, 2002.

These types of ordinances along with reports from around the state of private wells going dry and the surface elevation of the Great Salt Lake dropping to levels not seen since 1972[3] are a catalyst encouraging thought and discussion about policy decisions regarding Utah's water.

In this part of the report, Utah Foundation will focus on water consumption levels in the state, water prices relative to surrounding western states, conservation efforts and the issues surrounding the idea of shifting to a pay-per-use system and eliminating the tax support for water entities.

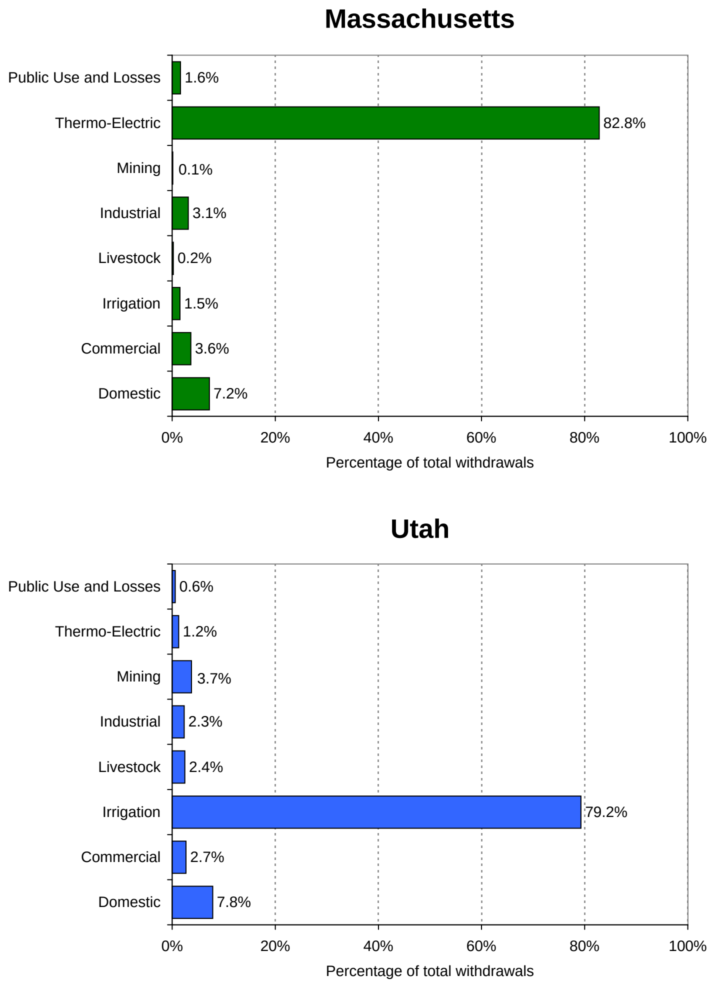
Water Consumption

Much of Utah's water was first allocated to agricultural purposes, and today, 85 percent of the water supply in the state is still used for agricultural production. The remaining 15 percent is used for what is commonly referred to as Municipal and Industrial (M&I) purposes. Municipal and industrial water is defined as

Figure 2

Water Consumption By Category

Massachusetts and Utah, 1995



Source: U.S. Geological Survey, *Estimated Use of Water in the United States 1985, 1990, & 1995.*

culinary and secondary water supplied for residential, commercial, industrial and institutional use. Culinary water is simply water that can be used for drinking. Secondary water cannot be used for drinking, but is adequate for outdoor use, such as grounds maintenance. There are some water districts in Utah that provide secondary water to their customers for the above uses. In this, Utah is unique, which makes comparisons to the rest of the United States difficult.

The high percentage of water allocated to agricultural production in Utah follows western water use patterns. In Idaho, agriculture accounts for 96 percent of total state water withdrawals. Nevada, Wyoming, Colorado, and Washington have similar percentages allotted to agricultural uses. While the agricultural industries in the east comprise only a fraction of water usage, those states must contend with equally high percentages of water going for one purpose; thermo-electric generation. In Massachusetts, for example, thermo-electric plants consume 82.8 percent of available water. In most states, water withdrawn for domestic use makes up less than 10 percent of the total water taken from surface and ground water sources. Figure 2 compares water withdrawals in Utah and Massachusetts by percentages.

When looking at the portion of water allocated to agriculture and the expansion of urban growth onto former agricultural land, one may be tempted to assume that all the water the agricultural sector uses can readily be transferred to Municipal and Industrial use. This is incorrect. Water for agriculture does not need to meet the stringent standards applied to drinking water. Often water treatment plants must be built or existing ones modified to clean former agricultural water so that it can be used within the culinary or secondary system.

However, despite the limited resources Utah has for it's M&I use, it is the second largest per capita water consumer in the nation. Utahns consume 255 gallons per day. This figure is reflects only water that is within the M&I system and does not account for any agricultural water users or homes and businesses that obtain water from private sources such as wells. The chart below compares the top five M&I water consumption states and the five that consume the least M&I water per capita. These figures are a subset of the numbers used in the chart above and remove all water used for mining, agricultural, and thermo-electric production as well as removing any residence or business that is self supplied. All of these data are from the 1995 U.S. Geological Survey Estimate of Water Use in the United States and are the latest available figures from the Geological Survey and all numbers are in gallons per day. The term 'deliveries' means the amount of water that arrives at the property. When calculating water usage it is important to note that all the water taken or 'withdrawn' from sources does not reach the end user. Leakages do occur. Appendix A lists all 50 states and ranks usage by both deliveries and withdrawals. Those states with older, less efficient water systems will be larger water consumers in the withdrawals category than they will be in the delivery category. This is of particular importance in the discussion of conservation and efficient systems as part of an overall state conservation plan.

Figure 3

Efficiency of Water Delivery Systems

States with the Highest and Lowest Per Capita Water Deliveries

	Rank		Per Capita	
State	**Withdrawals**	**Deliveries**	**Withdrawals**	**Deliveries**
Nevada	1	1	325	296
Utah	2	2	269	255
Washington	3	3	266	239
Idaho	5	4	243	213
Wyoming	4	5	261	212
Minnesota	45	46	145	114
Massachusetts	49	47	130	114
Pennsylvania	27	48	171	108
Rhode Island	49	49	130	100
West Virginia	48	50	134	100

Source: U.S. Geological Survey, *Estimated Use of Water in the United States 1985, 1990, & 1995.*

As Figure 4 illustrates, the largest M&I water users in any state are domestic or residential water users. Residences account for between 54 and 85 percent of the publicly delivered water demand. Commercial deliveries account for another 10 to 30 percent, as do industrial deliveries. The graph below shows the comparison, by percentage, of public water use in Utah and Massachusetts. It is noteworthy that in the most frugal water consuming states such as Massachusetts, residential water deliveries account for a smaller percentage of demand than in thirstier states, such as Utah.

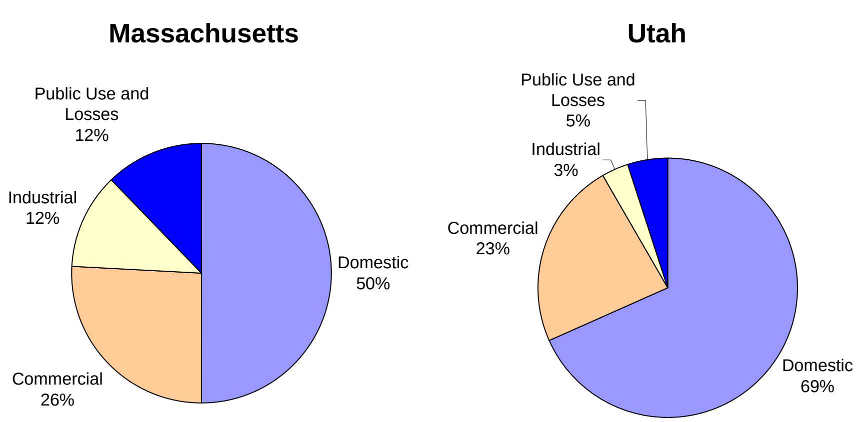
One reason for this may be that reliance on private well systems is greater in areas where there are adequate supplies of ground and surface water. Less than half of the residents in states such as Washington, Minnesota, and Rhode Island receive their residential water through the public water system. In western arid states, such as Utah, Nevada, and Idaho that percentage can climb as high as 75 percent. However, as the quality of water continues to deteriorate in more urbanized areas, there will probably be fewer people relying on private wells, as water that comes through a municipal treatment facility is usually viewed as safer and more clean. Also, those states that are more urban will have a higher demand by commercial and industrial sectors on their M&I water, thus driving residential use as a percentage of total M&I use down.

While these data give some insights into the infrastructure demands that water systems in Utah face, they do not explain why Utahans consume two and a half times the water as their counterparts in West Virginia, where approximately the same percentage of households receive their water

Figure 4

Consumption of Publicly Supplied Water by Category

Massachusetts and Utah, 1995



Source: U.S. Geological Survey, *Estimated Use of Water in the United States 1985, 1990, & 1995.*

through the municipal system. To better understand consumption, an examination of water usage patterns is necessary. A survey performed by the Utah Water Resources Division gives the most recent data on consumption patterns within the state. The survey, performed over two years, from 1998 to 2000, helps to clarify where and how Utahns are using water in their homes. The study confirms what researchers and water planners have long suspected, 63 percent of the water consumed by the average household is used for outdoor purposes.[4] Water used within the home accounted for approximately 68 gallons per capita per day, which is comparable to most other states. Total residential water consumption per capita per day was estimated at 183 gallons, about the same level that was estimated in 1995.

The good news is that water use per capita in Utah has declined in recent years.

The good news is that water use per capita in Utah has declined in recent years, according to a review of U.S. Geological Survey data from the years 1985-1995, the most recent data available. Part of this decline is due to voluntary conservation efforts by individuals. Builders installing water saving devices also contributed to the downward trend of water consumption. Another factor in this trend could be 'system slack' or elasticity. This idea is simply that those states with a high per capita consumption rate find it easier to absorb new users than those states with a low per capita level. Of those states that have seen large population growth, 68 percent (17 of 25) are states that had a per capita consumption rate above the national median. This compares with those states that have seen low population growth. Only 32 percent (8 of 25) have per capita consumption rates above the national median of 174 gallons per day.

However, despite the downward trend of water usage, the state still remains the second largest water consumer in the country in per capita terms. While it may seem self evident that the second driest state would be the second largest consumer, it is cause for concern in times of drought, when there is little water to spare. The state has built a system of reservoirs and holding facilities in an attempt to ameliorate the effects of dry years on the population. However, the stockpiling of water can only stretch so far, and unless citizens and businesses alike make conservation efforts, those stockpiles will be quickly depleted and it will be difficult to

Figure 5

Water Consumption and Population Growth

States Grouped by Population Growth and Water Consumption Rates, 1985-1995

	High Growth of Water Withdrawals					Low Growth of Water Withdrawals				
		1985-95 Population % Growth	1985-95 Water Withdrawals	Per Capita Gal/day 1995	Per Capita Growth 85-95		1985-95 Population % Growth	1985-95 Water Withdrawals	Per Capita Gal/day 1995	Per Capita Growth 85-95
High Population Growth	Arizona	35.3	6.2	206	2.9	Nevada	60.4	-38.5	325	-0.5
High Population Growth	Florida	25.0	7.1	170	-1.6	Utah	20.3	3.2	269	-5.6
High Population Growth	Washington	23.4	26.0	266	-1.5	California	19.1	-7.6	184	-15.7
High Population Growth	Georgia	20.6	6.8	195	8.6	Idaho	17.2	-32.3	242	-19.5
High Population Growth	Oregon	17.5	20.9	234	9.3	Colorado	16.5	1.5	208	-15.1
High Population Growth	New Mexico	17.0	7.0	225	-0.3	Delaware	16.2	-9.1	158	5.3
High Population Growth	Virginia	15.5	13.9	158	15.2	North Carolina	14.9	6.1	162	-6.1
High Population Growth	New Hampshire	14.9	47.7	141	0.6	Hawaii	13.5	-10.2	191	5.8
High Population Growth	Texas	14.8	17.0	187	-3.7	Alaska	13.0	-19.0	213	-2.7
High Population Growth	Maryland	13.8	15.2	200	-7.7	South Carolina	12.0	-9.1	200	40.1
High Population Growth	Tennessee	11.2	19.5	176	2.6	Alabama	7.3	-17.4	237	35.3
High Population Growth	Minnesota	10.1	19.8	145	-17.1					
High Population Growth	Vermont	10.0	348.4	149	-3.4					
High Population Growth	Wisconsin	8.2	7.6	169	-8.3					
Low Population Growth	Wyoming	-4.3	13.5	262	-12.2	North Dakota	-5.2	-3.4	149	10.8
Low Population Growth	Oklahoma	-0.2	60.6	194	5.1	West Virginia	-4.5	-15.1	133	15.7
Low Population Growth	Iowa	0.4	9.4	173	5.6	Louisiana	-1.8	-5.3	166	2.7
Low Population Growth	Connecticut	2.0	17.7	155	15.0	Rhode Island	2.1	0.5	130	-1.1
Low Population Growth	New York	2.0	10.5	185	3.0	Pennsylvania	2.3	-32.3	171	-12.5
Low Population Growth	Mississippi	4.0	27.5	152	10.3	Massachusetts	3.1	-43.0	130	-9.7
Low Population Growth	Illinois	4.3	37.2	175	-3.4	Nebraska	3.2	5.0	222	18.0
Low Population Growth	Indiana	6.1	13.8	156	-0.2	Ohio	3.9	-17.3	153	-4.1
Low Population Growth	Michigan	6.4	6.1	188	11.1	South Dakota	4.3	-31.9	146	0.1
Low Population Growth	Missouri	6.5	15.1	161	3.6	Kentucky	4.3	5.2	148	1.2
Low Population Growth	Arkansas	6.6	48.1	191	24.5	New Jersey	5.3	-12.0	150	-4.1
Low Population Growth						Montana	5.7	2.4	222	-13.8
Low Population Growth						Maine	6.4	-78.6	141	8.4
Low Population Growth						Kansas	6.6	-7.6	159	0.9

Median per capita consumption = 174 gallons per day.

Source: U.S. Geological Survey, *Estimated Use of Water in the United States 1985, 1990, & 1995* and U.S. Bureau of the Census, Population Estimates series.

replenish them for the next dry cycle.

Additionally, demand for water resources will continue to grow as population increases. Those cities and towns within the state that have seen the largest growth in population during the last two decades are also the municipalities with the lowest billing rates.

In December 1999, the Governor's Council of Economic Advisors[5] issued a memorandum which in part summarized the "context of present realities" concerning water development in Utah with the following five statements:

- Utah currently has high per capita water use and low water rates.
- Based on present demand and pricing practices, population and economic growth will continue to put pressure on the state's water supply.
- The most accessible and least costly sources of water have already been developed.
- Federal funds for new water development are dwindling and will continue to decline, if not disappear.
- Future water development will almost assuredly be funded from state and local revenue sources.

Perhaps the most critical of these five is the third point, those sources that are the most readily available are already part of the existing public water system. In order to supply continued growth and development in Utah, state water officials will need utilize less desirable water sources at a higher cost and with less federal money. With such constraints on the supply side of the economic equation, policy makers have increasingly turned their attention to water demand. While conservation may seem as a small part of the equation, reductions in consumption reduce the demand on current infrastructure and forestall the necessity of developing less desirable resources.

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Water Conservation

The idea of conservation is not new in Utah. The early pioneers' insistence that water use must benefit all members of the community, and the safeguards they built into the system to assure that those with newer claims on this resource not bear the brunt of a drought, set the precedent for conservation efforts.

Today, there are a variety of ways citizens of the state can continue this pioneer tradition. Some are voluntary, some are not, and some involve pricing water to encourage people to avoid wasteful practices. In a survey performed by the Utah Division of Water Resources, researchers estimate that if homeowners in Salt Lake City implemented some simple conservation measures, the potential water savings per year could be 45,000 gallons per household or 40 gallons per capita. These measures include such things as not over watering the lawn, ensuring swamp coolers are in good repair and retrofitting older homes with low flow plumbing devices. The following points highlight some of the common measures used to conserve water:

- Ensure the lawn is not over watered. Utah Water Resources estimates the average lawn is over watered by 18 percent.
- Retrofit structures built before 1993 with low flow plumbing devices. These are estimated to save 20 gallons per capita per day.

- Keep swamp coolers in good repair or switch to air-conditioning. Swamp coolers use an estimated 41 gallons per day during summer months.
- Plant outdoor vegetation that requires less water.
- Do not water during daylight hours, too much water evaporates off and can weaken the root structure of the plants, causing them to need more water to thrive.

Municipalities have long encouraged their citizens to incorporate these recommendations into daily life. Water Conservation Districts also have education programs they disseminate to the general public. However, most local governments and water agencies feel users are not giving enough heed to their suggestions. Hence, the penalties Sandy City just enacted to encourage compliance with conservation efforts. Other municipalities have switched to a block rate structuring of water pricing to encourage the frugal use of water during summer months. Two municipalities that have switched to alternative pricing are Salt Lake City, which has block rate pricing for water used during the summer, and Spanish Fork, which is in the process of converting to a pressurized irrigation system to deliver water suitable for outdoor use. Spanish Fork's pricing schedule is based on the size of a resident's lot with the underlying assumption those with larger lots will use more water.

Block rate pricing is a common tool among water utilities... This allows the rate to increase geometrically while consumption increases in a linear fashion, thus creating a dual incentive to practice frugal water habits.

Block rate pricing is a common tool among water utilities. There is a flat rate charged to everyone for the first block of water. This block is assumed to be adequate to perform everyday functions, such as bathing, cooking, cleaning, etc. This is called the 'lifeline' rate. Each additional block of water beyond this lifeline has a price attached to it and the rate increases with each block. For example, a municipality might set their flat rate at $10.00 for the lifeline block The next block of water might cost $1.00 per every thousand gallons up to 4,000 gallons, then the subsequent block would have a rate of $1.50 per every thousand gallons up to an additional 2,000 gallons. This allows the rate to increase geometrically while consumption increases in a linear fashion, thus creating a dual incentive to practice frugal water habits.

Spanish Fork has modified this idea to target the largest segment of residential water demand: irrigating the lawn. According to data published on the city's web site, as the pressurized irrigation system is installed, residents will be charge two monthly bills, one for standard residential water and the other for outside irrigation. The figure below highlights the new charges as well as estimates the cost savings or increases based on lot size.[6]

Calculations show that of the five lot sizes listed by the city, the three smallest will pay less under the new rate structure than the average home did under the old pricing system. Residents with lot sizes between 0.34 and 0.44 an acre will pay more and

Figure 6

Spanish Fork City

New Residential Water and Pressurized Irrigation Rates

Culinary Water	
Base Charge	$10.00 which includes up to 4,000 gallons
Additional Usage Charge	Usage over 4,000 gallons is $0.77 per 1,000 gallons
Pressurized Irrigation	
Lot Size	Rate
Under 6,000 sq. ft.	$6.75 per month year round
6,000 - 9,999 sq. ft.	$7.00 per month year round
10,000 - 14,999 sq. ft.	$7.50 per month year round
15,000 - 19,999 sq. ft.	$14.50 per month year round
20,000 sq. ft. and above	Metered same as culinary rates ($0.77 per 1,000 gallons)
Agricultural	Metered $0.46 per 1,000 gallons

Source: Spanish Fork City published utility rates at: http://205.118.70.8/administration/finance/billing/utility_rates.htm

Figure 7

Residential Water Rates in Western Cities

City	Estimated Cost per 1,000 gallons
Reno, NV	$3.39
Seattle, WA	2.30
Los Angeles, CA	2.22
Park City, UT	2.20
Tucson, AZ	1.81
Boise, ID	1.68
Las Vegas, NV	1.65
Phoenix, AZ	1.61
Albuquerque, NM	1.41
Denver, CO	1.14
Salt Lake City, UT	1.04
Provo, UT	0.75
Sacramento, CA	0.75
AVERAGE	$1.63
Utah Average	$1.15
National Average	$1.96

Sources: Out-of-state values adapted from "Western States Water Newsletter," dated December 31, 1998. In-state values taken from Utah Division of Drinking Water, *1999 Survey of Community Drinking Water Systems, 2000,* Appendix 7, 1-6.

an estimate could not be made for those with lots over 0.46 an acre. The average annual water bill under the new system is estimated to be $264.21, $5.61 higher than under the old system. All of these figures are estimates. Until the system is fully operational, the monthly costs to residents in Spanish Fork are difficult to determine. As is the likelihood that this new pricing scheme will actually encourage conservation. With a flat monthly fee, it is possible those residents with smaller lot sizes will begin to use more water than they did under the previous system. By implementing a secondary system for outdoor use, the city is relieving the demand on the culinary water infrastructure. This will help M&I supply meet demand, but not necessarily conserve water, unless residents feel they are paying a higher cost with the new system. Despite these conditions, the new pressurized irrigation pricing is an attempt to price water according to usage and place the burden of payment on those that use the most water.

The data show prices in Salt Lake City and Provo are lower than any other comparable city except Sacramento, California.

Water Pricing

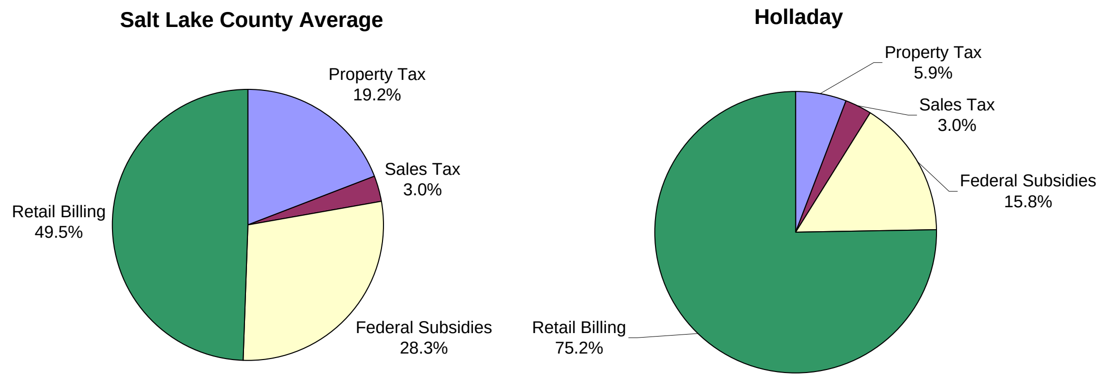
Highlighting Spanish Fork's new pricing schedule above is important in the discussion of water prices, especially since Utah has some of the lowest prices for water in the western United States. Figure Seven compares water prices in large communities in California, Arizona, New Mexico, Washington, Colorado, Idaho and Nevada. The data show prices in Salt Lake City and Provo are lower than any other comparable city except Sacramento, California. The average of all Utah cities and towns is higher than Denver and Sacramento's prices. Sacramento area water agencies have recently begun metering residents' water usage under pressure from federal and state government agencies; it is expected that this change will increase the cost of water in those communities.

A recent study into the pricing structure of water in Salt Lake County is helpful in understanding what keeps the cost of Utah water low, in comparison to the surrounding states. In April of 2001, Gail Blattenberger released a study entitled *The Price of Water in Salt Lake County (1998)*. The purpose of this study was to determine the true price of water within the county. Included within the report were data detailing what residents in a given community were paying in taxes compared with the retail bill they were charged every month. The results vary across areas and water districts but a generalization that can be made is that the monthly water bill only reflects approximately half the cost of water to most Salt Lake County residents. Nineteen percent of the cost of water within the county is paid for through property tax; another three percent through sales tax and another 28 percent are federal tax monies returned to the local area. Holladay has the highest percentage of its costs covered through retail

Figure 8

Water Funding Sources

Salt Lake County Average and Holladay, 1998



Source: Blattenberger, Gail *The Price of Water in Salt Lake County, 1998,* April 2001.

billings: 75.2 percent of the water to Holladay residents is paid for by monthly charges. Figure Eight depicts the average within the county and also the billing proportions in Holladay.

While levying a property tax to fund water development projects is an accepted practice, Utah differs from most states in one critical area: property tax revenue is used to pay for normal operating expenses. An examination of Utah water districts' comprehensive annual financial reports (CAFRs) shows that tax revenue accounts for, in some cases, over half of annual operating revenues. Water districts, when asked about the inclusion of property tax revenues into their operating budgets, insist that this is done to insure the districts receive the highest rating possible on their bond issues. When a governmental entity issues bonds for various projects, the entity is assigned a credit rating by analysts working for one of three rating agencies; Moody's, Standard and Poor's or Fitch. The analysts review the overall financial health of the entity seeking the rating as well as the local economy and specifics regarding the actual project. According to the information they gather, the analysts' assign a rating to the entity, the highest being AAA.

While levying a property tax to fund water development projects is an accepted practice, Utah differs from most states in one critical area: property tax revenue is used to pay for normal operating expenses.

A review of Denver's Official Statements, the documentation that accompanies bond issues, reveals that the water district has a rating as high as many large districts in Utah, and yet has never levied a property tax. A discussion with water district officials there revealed the district, because it is a separate entity from the city and county, does have taxing authority in its own right, but has not needed to levy a tax, even for development purposes. Further, the fact that the district has the ability to render such a tax was sufficient for ratings analysts to award the district its AA and AA+ ratings. This occurred while Denver has water prices below those in both Salt Lake City and Utah statewide averages.

Denver may have unique circumstances that allow for the district to operate within such favorable parameters. Also, the history of Colorado water resource development has not been one of cooperation, as has Utah's. Rates charged by the Denver water district in the past might have been significantly higher than those charged in Salt Lake City, allowing district officials to avoid large rate increases while developing new resources from accumulated capital. The Denver water district is used here as an illustrative example of a water entity that has managed to keep rates low and not had to levy property taxes. For this reason, it is significant to the discussion of whether Utahns should continue to pay for their water through a combination of taxes and monthly charges or switch to a straight pay-per-use system.

Water as a Commodity or a Public Good?

The debate over whether water should be paid for through taxation or strictly by consumption can be pared down to the above question: will citizens and policy makers continue to look at water as a public good, one that all must have access to, or has water become so scarce that it can only be viewed as a commodity? There are valid points to both sides of the argument. A few will be mentioned here.

Those who believe water is and should continue to be considered a public good point to the state's history and the fact that Utah's water development would not have been as equitable without the cooperative attitude of all users. They also assert that with careful management, the existing water resources can continue to supply the population growth well into the future. Finally a switch to a pay-per-use system would place the burden of water costs directly on those who can least afford it: average citizens. The argument continues that businesses and industrial operations, many of whom rely on private sources of water, still pay taxes and in larger proportions than do households. Further, because of Utah's large homeowner property tax exemption and the size and value of most business properties, their contribution to the tax base offsets that of the average citizen, who pays less in taxes than their water is worth. To remove the commercial and industrial 'subsidy' would cause prices to skyrocket unnecessarily and it would be households, especially poor ones, which would bear the brunt of rate increases. Those on this side of the argument are also concerned that a pay-per-use system would limit population growth through artificially limiting water availability.

Will citizens and policy makers continue to look at water as a public good, one that all must have access to, or has water become so scarce that it can only be viewed as a commodity?

Those on the other side of the debate emphasize that water resources within the state have been developed to the point that there is no more easily accessible water available. Any further development would come at great expense to the state. Unless water use is curbed now, future generations would be forced to pay astronomical costs for this development with relatively little return. Further, a pay-per-use system with the anticipated higher prices would force people to be more careful about how they use water. Conservation would become an everyday part of life and not something that needs to be mandated by municipal governments. Finally, pay-per-use systems would be equitable, forcing those who use the most of the resource to pay the highest price for that use.

Both sides have valid arguments and it is beyond the scope of this report to prove or disprove either of them. However, for those who believe Utah cannot afford to lessen its dependence on taxes to offset water costs, the research would suggest that Denver has been successful in achieving this goal. For those who argue higher prices encourage conservation, an examination of the price listings in Figure Seven relative to the per capita consumption rates in Appendix A would suggest otherwise. Even removing agricultural water from the mix and focusing solely on residential per capita consumption, the data seem to run counter to the argument that higher prices will significantly impact how much water people use.

In closing, Utah has had, through its history, a unique system of water development, one that has been based on the ideals of cooperation and the greatest good to the greatest number of people. Going forward, policy makers need to keep these ideals in mind while facing the cyclical challenges of drought and abundance.

Endnotes

[1] Data from the US Department of Agriculture, Natural Resources Conservation Service SNOTEL. Data current as of March 25, 2002.

[2] Associated Press Brief in the Daily Herald dated March 31, 2002.

[3] Hardy, Rodger "Sputtering Utah County wells spur search for new water sources", Deseret News March 30, 2002.

Arave, Lynne "Drought taking toll on Great Salt Lake", Deseret News March 30, 2002 and US Geological Survey data on the surface elevation of the Great Salt Lake.

[4] State of Utah Department of Natural Resources, Division of Water Resources, "Identifying Residential Water Use: Survey Results and Analysis of Residential Water Use for Thirteen Communities in Utah", January 2001.

[5] The Council of Economic Advisors is charged with advising the Governor on economic policy issues affecting Utah. The membership is comprised of economists from various private, public and institutional offices.

[6] Pricing schedule taken from the City of Spanish Fork's web site. Estimates of water consumption based on data from the Utah Division of Water Resources survey, "Identifying Residential Water Use." Spanish Fork was not included in the survey so consumption data are based on Springville data. Springville is the closest in terms of proximity to Spanish Fork, therefore the assumption was made the consumption patterns would be similar. Price calculations are assuming that there is an equal number of lots in each size category, no weighting measures were employed to adjust for a large number of lots within a single category.

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Appendix A: Efficiency of Water Delivery Systems

	Rank		Per Capita		Per Capita	Leakage as %	Rank: Efficiency
State	Withdrawals	Deliveries	Withdrawals	Deliveries	Leakage	of Withdrawals	of System
Nevada	1	1	325	296	29	9.0%	7
Utah	2	2	269	255	14	5.2%	1
Washington	3	3	266	239	27	10.2%	12
Idaho	5	4	243	213	30	12.4%	19
Wyoming	4	5	261	212	49	18.7%	38
Alabama	6	6	237	210	27	11.6%	16
Oregon	7	7	235	206	29	12.5%	20
New Mexico	8	8	225	204	21	9.5%	8
Nebraska	10	9	221	202	19	8.8%	6
Alaska	11	10	212	192	20	9.6%	9
Arizona	13	11	206	185	21	10.1%	10
Oklahoma	17	12	194	182	12	6.2%	2
Colorado	12	13	208	181	27	12.8%	22
South Carolina	14	14	200	170	30	15.1%	33
Georgia	16	15	195	168	27	14.0%	26
Michigan	20	16	188	166	22	11.7%	17
California	22	17	185	164	21	11.5%	15
Texas	20	18	188	164	24	13.0%	23
Hawaii	18	19	191	163	28	14.5%	28
Montana	9	20	222	161	61	27.4%	48
New York	22	21	185	159	26	14.0%	27
Tennessee	24	22	176	158	18	10.1%	11
Arkansas	18	23	191	154	37	19.4%	39
Louisiana	30	24	166	145	21	12.7%	21
Florida	28	25	169	144	25	14.7%	31
Illinois	25	26	175	144	31	17.8%	37
North Carolina	31	27	162	140	22	13.7%	25
Delaware	33	28	159	138	21	13.0%	24
Kentucky	42	29	148	135	13	8.7%	5
Maryland	14	30	200	135	65	32.5%	49
Mississippi	39	31	152	135	17	11.5%	14
South Dakota	44	32	147	134	13	8.6%	4
Virginia	33	33	159	134	25	15.7%	34
Indiana	36	34	156	133	23	14.6%	30
Missouri	32	35	161	133	28	17.7%	36
Iowa	26	36	173	133	40	23.4%	45
Vermont	42	37	148	132	16	11.0%	13
New Hampshire	47	38	140	131	9	6.4%	3
Ohio	38	39	153	130	23	15.0%	32
Connecticut	37	40	155	128	27	17.6%	35
Kansas	33	41	159	128	31	19.8%	41
Wisconsin	28	42	169	127	42	24.9%	46
Maine	46	43	142	121	21	14.5%	29
New Jersey	40	44	150	121	29	19.5%	40
North Dakota	41	45	149	119	30	20.4%	42
Minnesota	45	46	145	114	31	21.1%	43
Massachusetts	49	47	130	114	16	12.2%	18
Pennsylvania	27	48	171	108	63	36.9%	50
Rhode Island	49	49	130	100	30	22.9%	44
West Virginia	48	50	134	100	34	25.4%	47

Source: U.S. Geological Survey, *Estimated Use of Water in the United States 1985, 1990, & 1995.*

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